

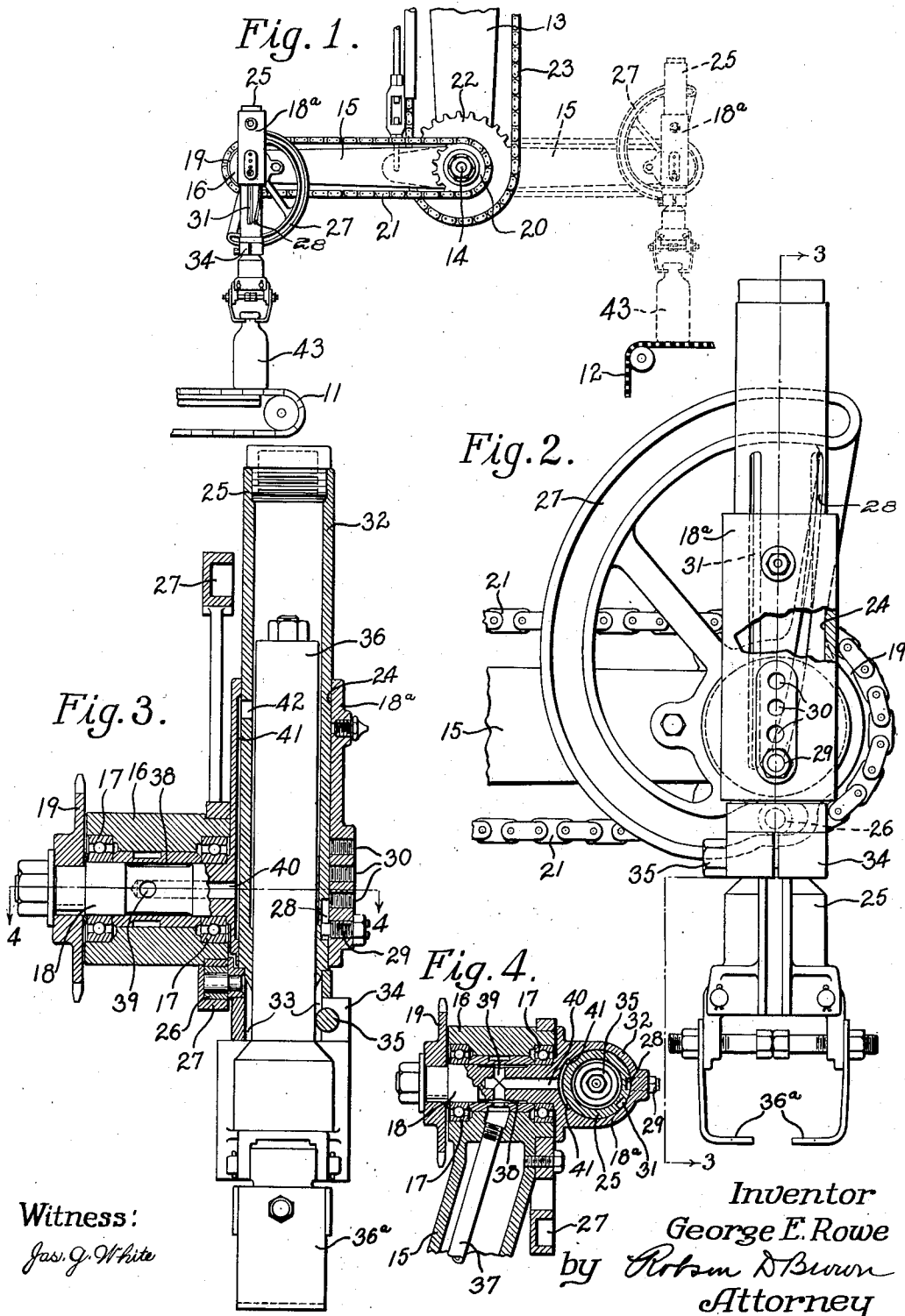
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APPARATUS FOR HANDLING GLASSWARE

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APPARATUS FOR HANDLING GLASSWARE

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This invention relates to automatic stackers or devices for transferring glassware from one position to another, such as from a buck to the conveyor belt of a lehr. More specifically, the invention relates to improvements in stackers of the general character described in the U. S. application of Edward H. Lorenz for Letters Patent, filed July 11, 1927, Serial No. 204,875, although it is not necessarily confined in its use to that type of stacker.

An automatic stacker of the type described in the hereinbefore mentioned application of Lorenz comprises a transfer arm which oscillates about a horizontal axis between a ware-receiving position and a ware-delivery position and carries gripping means for engaging and holding the ware to be transferred. One of the objects of the present invention is to provide improved means for delivering ware at a different height from that at which it is received. An oscillating arm of the device described in the above application, while primarily intended to operate between ware receiving and delivering positions in the same plane, and therefore from and to positions in which the arm is horizontal, may also be used to operate from and to positions in which the arm is not horizontal, as when it receives at a position above or below the plane of the delivery position. The operation of the transfer arm is more satisfactory when the ware-receiving and ware-delivery positions of the transfer arm are not greatly displaced from the horizontal.

Specifically, it is one of the objects of the present invention to pick up ware at one level and deliver it at a different level, the movement of the oscillating arm being between substantially horizontal positions, whereby the difference in height between receiving and delivering positions, heretofore attainable with a moderate displacement of the transfer arm from the horizontal may have added thereto the range in height difference obtained by the use of the hereindescribed improvement.

A further object of the invention is to provide improved means for transferring rectangular shaped bottles or "panels" whereby such panels picked up by the transfer device

in one angular position with respect to their vertical axes will be automatically turned about such vertical axes into a different angular position and deposited upon the conveyor belt in such new position. A still further object of the invention is to provide means for the ready adjustment of the amount of turning imparted to the ware in passing from the ware-receiving to the ware-delivery position.

A still further object of the invention is to provide such a mechanism having means whereby the angle through which the ware is rotated may be selected and from time to time varied, whereby the device may readily function in the receipt of panels from bucks or conveyors differently disposed relative to the center line of the lehr conveyor on which the ware is to be deposited without varying the angular position in which they are deposited on the conveyor.

Another object of the invention is to effect the operation of the means for changing the height between receiving and delivery positions and the means for changing the angular position of panels from the transferring movement of the transfer device.

In order to more clearly explain the invention, one embodiment thereof is shown in the accompanying drawing, in which:

Figure 1 is an elevation of a portion of an automatic stacker or transfer device in which is incorporated one form of the invention:

Fig. 2 is an enlarged elevation of a part of the same mechanism shown in Fig. 1, in a position for delivering ware at a point higher than the point at which the ware was received:

Fig. 3 is an elevation partly in section taken on the line 3—3 of Fig. 2; and

Fig. 4 is a detailed section, taken on the line 4—4 of Fig. 3.

In Fig. 1 is shown a buck 11 from which ware is to be transferred to a conveyor belt 12 of a lehr. More generically, the former may be considered as a ware-receiving station, and the latter as a ware-delivery station for the transfer device. A support 13 (corresponding to the supporting bracket 25 of the Lorenz application aforesaid) is adapt-

ed to be positioned intermediate the ware-receiving and the ware-delivery stations and carries a horizontal shaft 14 which may be suitably secured thereto so as not to rotate. One end of an arm 15 is rotatably mounted on the shaft 14 and is provided at its other end with a hub 16 in which there are bearings 17 for a horizontal shaft 18 which carries a holder 18^a for the tongs mechanism to be hereinafter described.

A sprocket wheel 19 may be secured to the shaft 18 and a similar sprocket wheel 20 may be secured to the stationary shaft 14. Sprocket wheels 19 and 20 are connected by a chain 21 so that, as the arm 15 is rotated and due to the fact that the wheels 19 and 20 are the same size, the holder 18^a is maintained in a position parallel to its original position throughout, which is preferably a substantially vertical position. The arm 15 may be oscillated periodically between the ware-receiving position and the ware-delivery position by any suitable means, such as sprocket wheel 22 secured to the arm for rotation about the axis of the shaft 14 and a chain 23.

Referring more particularly to Fig. 3, the holder 18^a may be provided with a vertical cylindrical aperture 24 in which is mounted for reciprocating movement, a tongs mechanism 25. Provision is made for reciprocating the tongs mechanism 25 by a cam roller 26 carried thereby, which cam roller engages a cam 27 carried by the arm 15 so that the rotation of the arm 15 from the full line position of Fig. 1 to the dotted line position thereof operates through the cam roller 26 and the cam 27 to raise the tongs mechanism 25 to a higher position relative to the arm 15 at the ware-delivery position (shown in dotted lines) than at the ware-receiving position (shown in full lines).

The tongs mechanism 25 may be provided with a helical groove 28 which is engaged by a stud 29 threaded through the holder 18^a. As the tongs mechanism is reciprocated vertically, the stud 29 and the groove 28 cooperate to turn the tongs mechanism around the vertical axis of the tongs and the ware being transferred to align the ware on the conveyor belt in a different angular position from that in which it was received. Preferably, the angle through which the tongs mechanism turns is made adjustable. As shown, the groove 28 has a different pitch at its upper portion from that at its lower portion. A plurality of tapped holes 30 permits the stud 29 to be set in different positions so that in its vertical movement, the tongs mechanism 25 will present for engagement with the stud 29 different portions of the groove 28 having different pitches so that different degrees of turning will be obtained. If desired, a slide carrying the stud 29 may be provided in lieu of the plurality of holes 30, so that the stud 29 may be changed

through a theoretically infinite number of minute gradations. A substantially vertical groove 31 may be also provided which the stud 29 may engage instead of the helical groove 28 when the ware being transferred is of such a nature, as, for example, in the case of ordinary milk bottles, that it is not necessary that it be aligned angularly in any definite manner.

The tongs mechanism 25 may comprise an outer cylinder 32 which is split at its lower end 33 and is engaged by a split collar 34 which may be tightened by a bolt 35. Disposed within the cylinder 32 and secured thereto by the tightening of the collar 34 is a barrel 36 which in turn carries suitable mechanism for operating ware-engaging tongs 36a. The operation is preferably done by means of compressed air and spring mechanism, the air being introduced through a pipe 37 passing through the arm 15. From the pipe 37, the air passes into an annular groove 38 between the arm and the shaft, through radial apertures 39 in the shaft, an axial passage 40 in the shaft, a groove 41 extending longitudinally of the cylinder 32 and through an aperture 42 into the interior of the cylinder 32.

The detailed structure of the tongs opening and closing mechanism and the valve for operating the same are no part of the present invention and need not be described herein, although reference may be made to the hereinbefore mentioned application Serial No. 204,875 for one mode of operating these parts of the mechanism.

In operation, the arm 15 is swung into the position shown in full lines in Fig. 1. Air pressure is exhausted through the pipe 37 and the various passages to the tongs-operating mechanism, whereby a spring (not shown) closes the tongs which engage a bottle 43. The arm, tongs, and bottle are then, by means of the chain 23, swung into the position shown in dotted lines in Fig. 1, which is a ware-delivery position. As the arm 15 is rotated, new portions of the cam 27 successively engage the cam roller 26 and raise the tongs mechanism 25 from the position shown at the left, to the position shown at the right. While the arm 15 thus moves from one horizontal position to another, the tongs 36a receive the bottle from the lower height of the buck 11 and deliver it at a higher level to the conveyor belt 12. At the same time, the upward movement of the cylinder 32 in the aperture 24 serves, because of the engagement of the groove 28 with the stud 29, to rotate the tongs mechanism through a definite predetermined angle so that each article of glassware delivered on the conveyor belt may be deposited in a definite and preferred angular relation to the center line of the belt and with respect to the other bottles deposited thereon. When the bottle 43

has been deposited on the conveyor belt 12, air pressure is admitted through the hereinbefore described passages to release the tongs 36a. Thereafter, the arm 15 is swung back from the ware-delivery position to the ware-receiving position and the previously-described cycle of operation is repeated.

As hereinbefore described, the pitch of the helical groove 28 is different at different portions thereof, so that by inserting the stud 29 in a different hole 30, the amount of rotative movement of the tongs mechanism 25 may be altered at will, although, of course, a certain alteration will be had using a groove as 28 of constant pitch. Also, if it is desired that the ware shall not be rotated around its vertical axis, the stud 29 may be inserted in the longitudinal groove 31, in which case there will be merely a longitudinal movement of the tongs mechanism 25, but no rotation thereof. The cam 27 may be removed and replaced with a cam of a different contour so as to elevate the ware a different amount or to lower it instead of elevating it.

It will thus be seen that there has been provided simple and effective means for transferring ware from a receiving station to the delivery station wherein an oscillating arm extends in a substantially horizontal direction at the moment of either receiving or delivering ware, although the ware is picked up at one height and delivered at another height. One advantage resulting from the foregoing is that the direction of movement of the holder-carrying end of the transfer arm is substantially vertical at the moment that the tongs mechanism is picking up the ware, thus obviating the tendency to mar the ware when the tongs mechanism engages the ware while there is a substantial lateral component of movement. The present invention is also particularly useful in connection with stackers such as that described in the hereinbefore-mentioned application, Serial No. 204,875, as the vertical movement of the ware with respect to the transfer arm is accomplished without altering the lateral distance of the ware-receiving station from the horizontal axis of the transfer arm.

It is to be understood that the hereinbefore-described embodiment of the invention is for the purpose of illustration only, and various changes may be made therein without departing from the spirit and scope of the invention as defined in the appended claims.

I claim as my invention:

1. In a glassware transferring device, a transfer arm adapted for oscillation between a ware-receiving position and a ware-delivery position, ware gripping means carried by said arm, means for oscillating said arm, and means operated by the oscillation of said arm for automatically changing the height of said gripping means with respect to said

arm as the latter is oscillated between its ware-receiving position and its ware-delivery position.

2. In a glassware transferring device, a transfer arm pivotally supported at one end thereof, gripping means carried by the other end of said arm, means for oscillating said arm about its pivot between a predetermined ware-receiving position and a predetermined ware-delivery position, and means for automatically changing the height of said gripping means with respect to said arm by a predetermined amount as said arm and gripping means move from ware-receiving position to ware-delivery position.

3. In a glassware transferring device, a transfer arm adapted to move substantially 180° about a horizontal axis between a predetermined ware-receiving position at one side of the axis to a predetermined ware-delivery position at the other side of the axis, tong members carried by said arm, and means for automatically changing the position of the tong members vertically with respect to the arm by a predetermined amount during the movement of the arm and the tong members from the ware-receiving position to the ware-delivery position.

4. In a glassware transferring device, a transfer arm adapted to move substantially 180° about a horizontal axis between a horizontal predetermined ware-receiving position and a horizontal predetermined ware-delivery position, means for gripping the ware carried by said arm, and means for automatically changing the height of the gripping means relative to the transfer arm by a predetermined amount between the ware-receiving position and the ware-delivery position of the gripping means so that the ware transferred thereby may be delivered at a different height from the height at which it is received.

5. In a glassware transferring device, a transfer arm adapted to move substantially 180° about a horizontal axis between a horizontal predetermined ware-receiving position and a horizontal predetermined ware-delivery position, tong members carried by said arm, and means for automatically changing the position of the tong members vertically with respect to the arm by a predetermined amount during the movement of the arm and tong members from the ware-receiving position to the ware-delivery position.

6. In a glassware transferring device, a transfer arm adapted to move substantially 180° about a horizontal axis between a horizontal predetermined ware-receiving position and a horizontal predetermined ware-delivery position, tong members carried by said arm, means for maintaining the tong members and the ware gripped thereby during oscillation of the arm in positions parallel to their position when the transfer arm is in

the ware-receiving position, and means for automatically changing the position of the tong members vertically with respect to the arm by a predetermined amount during the movement of the arm and tong members from the ware-receiving position to the ware-delivery position.

7. In a glassware transferring device, a transfer arm adapted for movement about a horizontal axis, a holder pivotally carried by said arm and having a vertical aperture therein, tongs mechanism slidably mounted in said vertical aperture, means for turning said holder about its pivot as the arm rotates, whereby said holder is maintained substantially vertical, and means for moving said tongs mechanism in said aperture to change the height of said tongs mechanism as it is moved from ware-receiving position to ware-delivery position.

8. In a glassware transferring device, a transfer arm adapted for movement about a horizontal axis, a holder pivotally carried by said arm and having a vertical cylindrical aperture therein, tongs mechanism mounted in said vertical aperture, means for turning said holder about its pivot as the arm rotates, whereby said holder is maintained substantially vertical, means for moving said tongs mechanism vertically in said aperture to change the height of said tongs mechanism as it is moved from ware-receiving position to ware-delivery position, and means for rotating said tongs mechanism in said holder.

9. In a glassware transferring device, a transfer arm adapted for movement about a horizontal axis, a holder pivotally carried by said arm and having a vertical cylindrical aperture therein, tongs mechanism mounted in said vertical aperture, means for turning said holder about its pivot as the arm rotates, whereby said holder is maintained substantially vertical, means for moving said tongs mechanism vertically in said aperture to change the height of said tongs mechanism as it is moved from ware-receiving position to ware-delivery position, and cam connections between said tongs mechanism and said holder whereby the vertical movement of the tongs mechanism rotates said tongs mechanism about its vertical axis.

10. In a glassware transferring device, a transfer arm adapted for movement about a horizontal axis, a holder pivotally carried by said arm and having a vertical aperture therein, tongs mechanism mounted in said vertical aperture, means for turning said holder about its pivot as the arm rotates whereby said holder is maintained substantially vertical, a cam carried by said arm, and a cam roller mounted on said tongs mechanism and engaging said cam whereby the tongs mechanism is reciprocated in said aperture as the arm is oscillated about said horizontal axis.

11. In a glassware transferring device, a

transfer arm adapted for movement about a horizontal axis, a holder pivotally carried by said arm and having a vertical cylindrical aperture therein, tongs mechanism mounted in said vertical aperture, means for turning said holder about its pivot as the arm rotates whereby said holder is maintained substantially vertical, means for moving said tongs mechanism vertically in said aperture to change the height of said tongs mechanism as it is moved from ware-receiving position to ware-delivery position, and cam connections between said tongs mechanism and said holder whereby the vertical movement of the tongs mechanism rotates said tongs mechanism, said cam connections being adjustable to vary the amount of rotation of the tongs mechanism which takes place between the ware-receiving position and the ware-delivery position.

12. In a glassware transferring device, a transfer arm adapted for movement about a horizontal axis, a holder pivotally carried by said arm and having a vertical cylindrical aperture therein, tongs mechanism mounted in said vertical aperture, means for turning said holder about its pivot as the arm rotates, whereby said holder is maintained substantially vertical, a cam carried by said arm, a cam roller mounted on said tongs mechanism and engaging said cam, whereby the said tongs mechanism is reciprocated in said aperture as the arm is oscillated about said horizontal axis, a stud carried by said holder and engaging a helical cam groove in said tongs mechanism, whereby the vertical sliding movement of said tongs mechanism rotates the same.

13. In a glassware transferring device, a transfer arm adapted for movement about a horizontal axis, a holder pivotally carried by said arm and having a vertical cylindrical aperture therein, tongs mechanism mounted in said vertical aperture, means for turning said holder about its pivot as the arm rotates, whereby said holder is maintained substantially vertical, a cam carried by said arm, a cam roller mounted on said tongs mechanism and engaging said cam, whereby said tongs mechanism is reciprocated in said aperture as the arm is oscillated about said horizontal axis, a stud carried by said holder and engaging a helical cam groove in said tongs mechanism, whereby the vertical sliding movement of said tongs mechanism rotates the same, said helical cam groove having a different pitch in different portions thereof, and said stud being adjustable in position to engage different portions of said cam groove, whereby the amount of rotation of the tongs mechanism may be changed.

14. In a glassware transferring device, means for gripping the ware, a slidable shaft carrying the gripping means, a holder for the shaft, means for rotating the holder in a

vertical plane, and means dependent on said rotation for reciprocating said shaft within the holder.

15. In a glassware transfer device, the combination of means for moving said ware laterally, additional means for moving said ware vertically, and means for rotating the ware about its vertical axis the last two means being actuated by the movement of the first means.

16. In a glassware transfer device, the combination of means for moving said ware laterally, additional means for moving said ware vertically, means for rotating the ware about its vertical axis, the last two means being actuated by the movement of the first means, and means for adjustably determining the amount the ware is rotated about its axis during the transfer.

17. In a glassware transferring device, the combination of means for rotating said ware about a horizontal axis, additional means for moving said ware vertically with respect to the first named means and further means for maintaining the ware substantially vertical the last two means being actuated by the movement of the first means.

18. In a glassware transferring device, means for moving said ware laterally, additional means for moving said ware vertically, and means controlled by the second named means for rotating said ware the last two means being actuated by the movement of the first means.

19. In a glassware transferring device, a transfer arm movable about a horizontal axis, a holder pivotally carried by said arm and having a vertical guideway therein, tongs mechanism slidably mounted in said guideway, means for maintaining said holder substantially vertical during movement of the transfer arm, and means reciprocating the tongs mechanism in said guideway as the arm is moved about said horizontal axis.

Signed at Hartford, Connecticut this 17th day of August 1928.

GEORGE E. ROWE.

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